Route & File in W yo min

Wyoming Mineral Corporation

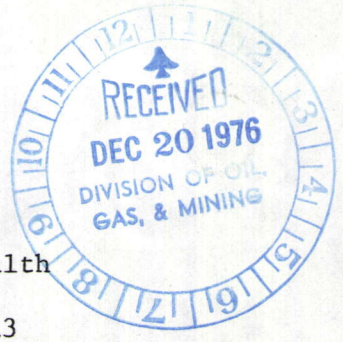
Exploration and Mining Division

L&S-76-917
3900 S. Wadsworth Blvd.
Lakewood, Colo. 80235
Phone 303 988-8530

A Subsidiary of
Westinghouse Electric Corporation

7 B&B

December 15, 1976



Lynn M. Thatcher
Deputy Director of Health
Utah State Division of Health
44 Medical Drive
Salt Lake City, Utah 84113

Subject: Notice of Construction/State of Utah Air Emissions Permit

Dear Mr. Thatcher:

Wyoming Mineral Corporation would like to make formal application for an air emissions permit by filing a notice of construction for a uranium recovery plant at Copperton, Utah. Air emissions are expected to arise from a boiler, the precipitation circuit, and the dryer.

In order to answer any questions you may have on plant air emissions, please find enclosed a generalized description of the plant (attachment A), air emissions data (attachment B), and air monitoring programs (attachment C). Should you have any further questions or need any additional information, please do not hesitate to call.

Sincerely yours,

W. H. Ford

W.H. Ford, Engineer
Licensing and Safety

WHF/tlu
Attachments, (3)

cc: Ron W. Daniels,
Coordinator-Mineral Land Dept. ✓

Tony Bullock,
Industrial Commission of Utah

Dennis R. Daily,
Utah State Div. of Health

ATTACHMENT A

GENERALIZED DESCRIPTION OF THE URANIUM/COPPER PROJECT COPPERTON SITE

Wyoming Mineral Corporation in cooperation with Kennecott Copper Corporation plans to construct a uranium extraction plant on a 1.3 acre site near Copperton, Utah on Kennecott Copper Corporation property. (Figures 1, 2 and 3) This plant will recover an estimated 143,000 pounds of uranium (U_3O_8) per year from a portion of the waters now used by Kennecott Copper Corporation in its mine dump leach operation. There will be no conventional mining activities such as earth moving or waste dumps associated with Wyoming Mineral Corporation activities at Copperton.

PROCESS

The waste dumps utilized by the Kennecott operations contain low concentrations of copper, uranium and other metals which are leached by the natural actions of water, oxygen and bacteria.

Kennecott's plant now processes approximately 46,500 gallons per minute of dump drainage water to recover the dissolved copper. Wyoming Mineral will divert approximately 6,666 gallons per minute of this water as it leaves the Kennecott plant, recover the uranium present and return the residual water to the Kennecott process. (See Figure 4 "Process Flow Sheet")

The uranium extraction plant will employ a continuous process in which the uranium is removed from solution by absorption with an ion-exchange resin. Subsequently, the uranium will be removed from the resin by a sulfuric acid solution. The resin will then be recycled to absorb more uranium. The sulfuric acid solution will be mixed with an organic solvent to extract the uranium from the acid and to concentrate the uranium in the organic solvent. The organic solvent

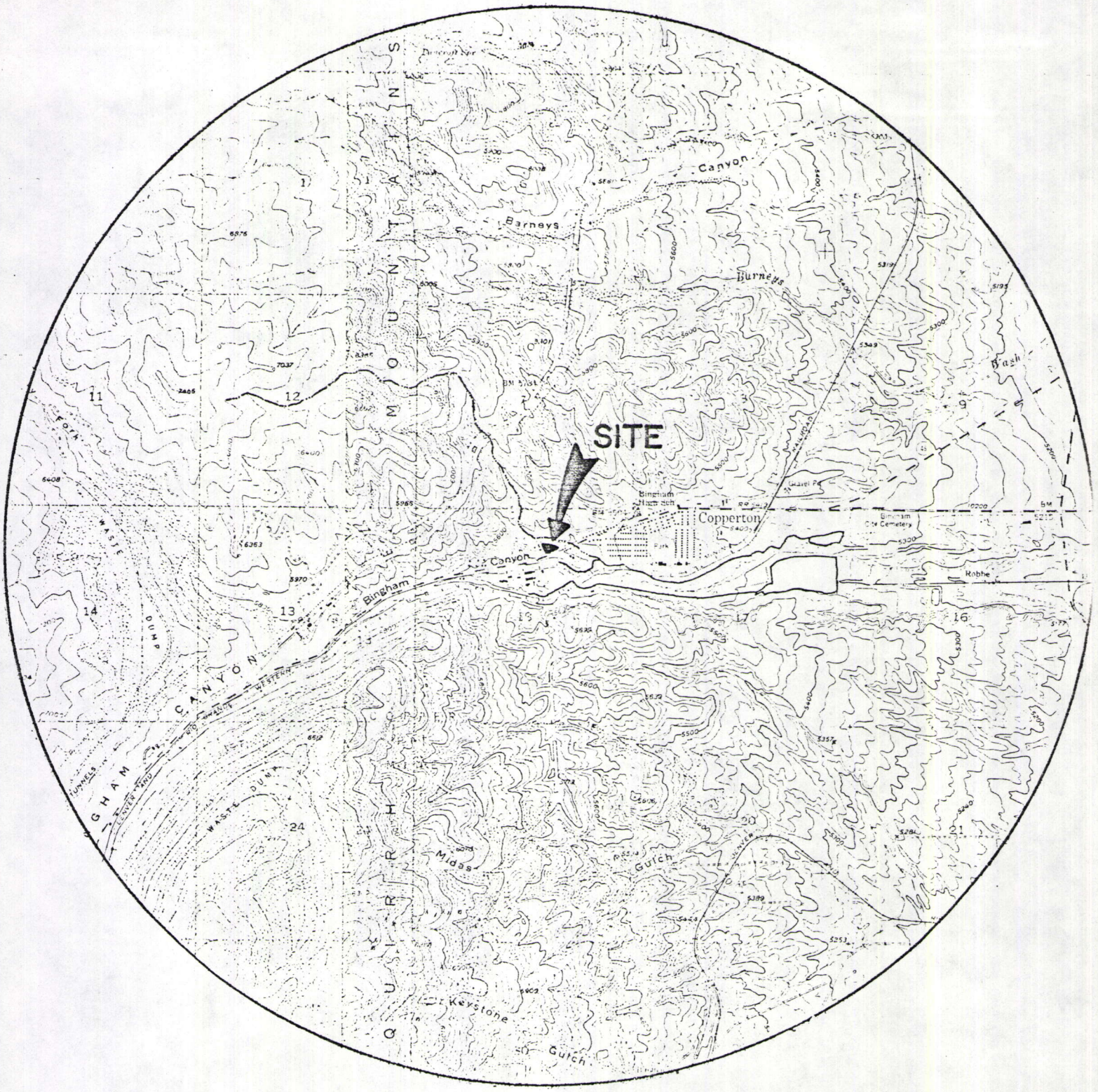


FIGURE 1: AREA WITHIN 2.5 MILE RADIUS OF SITE.

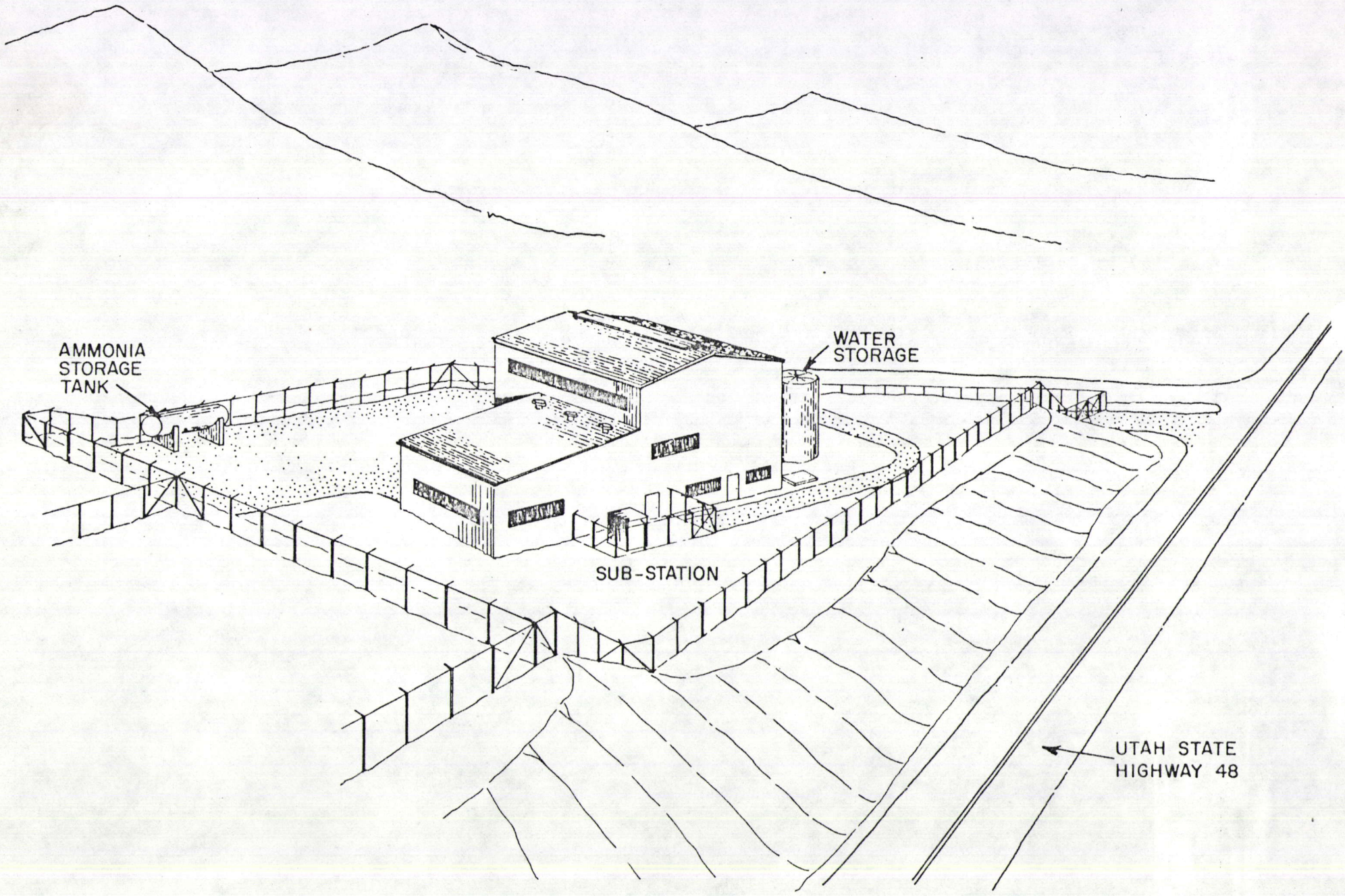


FIGURE 2: ARTISTS CONCEPT OF THE
WYOMING MINERAL CORPORATION URANIUM EXTRACTION PLANT

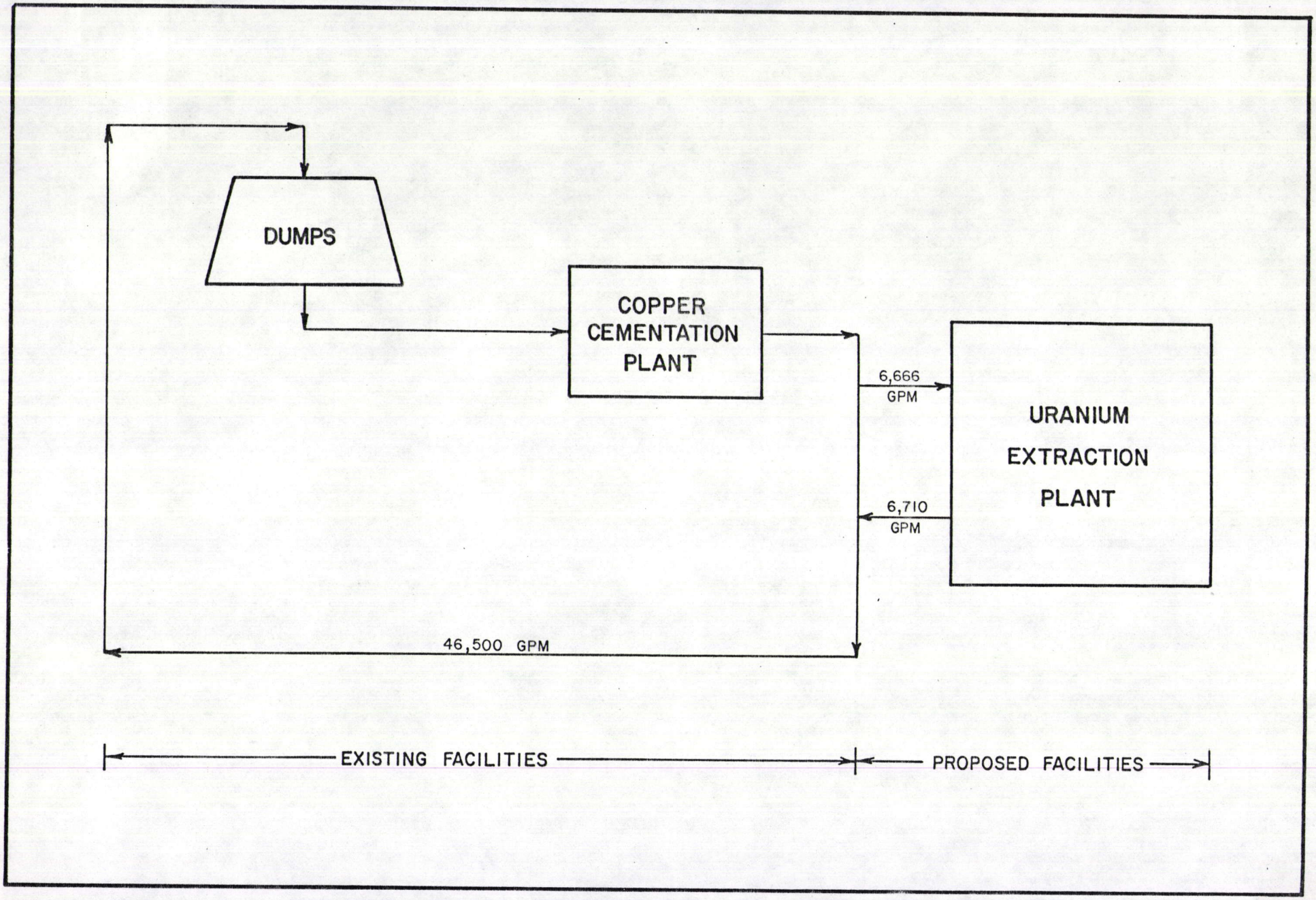


FIGURE 3: GENERAL LEACH SOLUTION FLOW SHEET

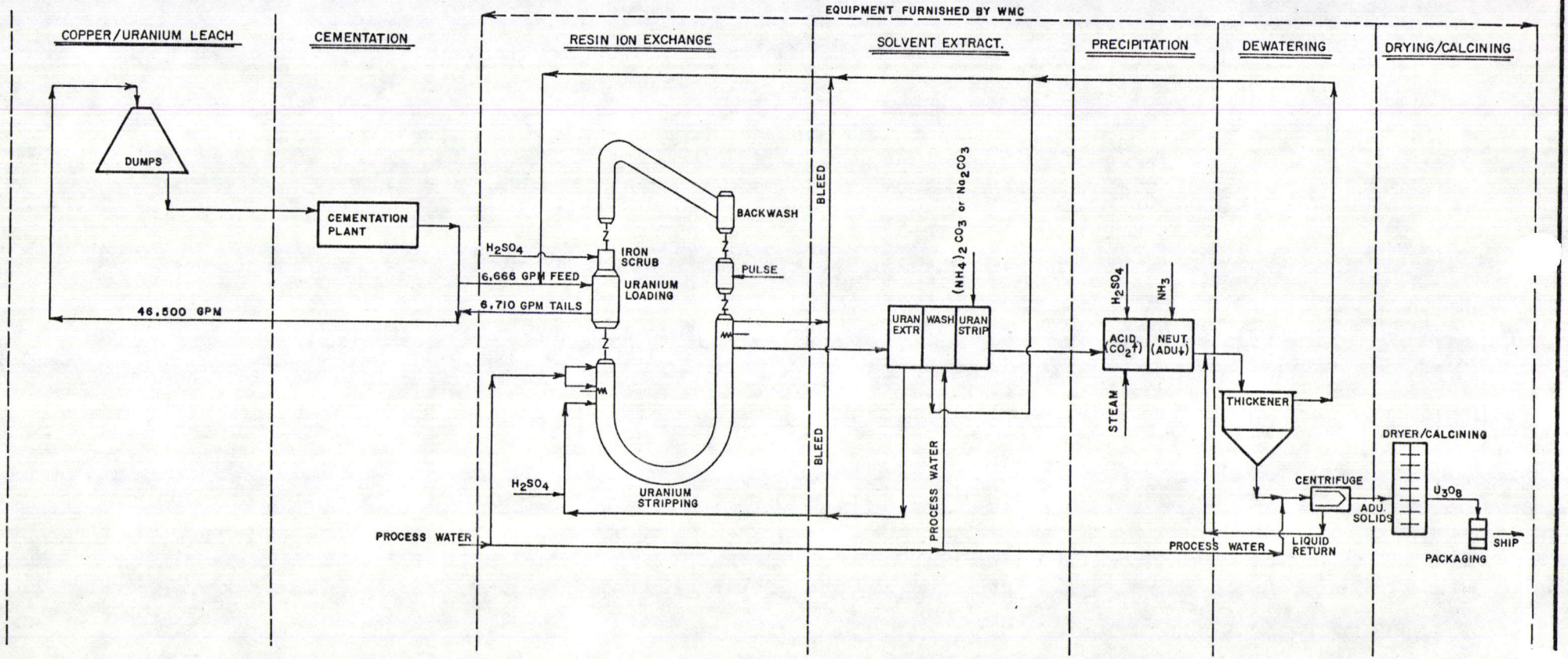


FIGURE 4: PROCESS FLOW SHEET (ESTIMATED FLOWS)

will be stripped of its uranium with a sodium bicarbonate solution. Acid and then ammonia will be introduced into the solution, causing ammonium diuranate to precipitate. The ammonium diuranate will then be thickened, dewatered and washed before being dried to U_3O_8. The final product is discharged into drums for shipment to a uranium conversion plant. Approximately 430 pounds of calcined uranium oxide (U_3O_8) will be produced each day.

PHYSICAL PLANT

The Copperton plant of Wyoming Mineral Corporation will be located on a 1.3 acre site west of Copperton on the north side of Utah State Highway 48 and immediately to the east of Kennecott's geology building (Figure 3). The site, owned by Kennecott Copper Corporation, and leased to Wyoming Mineral Corporation, consists of approximately two acres which are presently vacant and zoned for heavy industrial use.

The proposed plant will cover approximately 8,000 square feet, the remainder of the site being allocated to storage, loading and parking areas (Figure 3). The tallest building (approximately 50 ft. high) will house the ion-exchange and calcining equipment. This building will interconnect with buildings housing the solvent extraction equipment, storage areas, laboratory and the plant office. Smaller surface structures will include the fire pumphouse, a water tank, sulfuric acid storage tank, ammonia storage tank, fuel oil storage tank and an electrical substation.

UTILITIES AND SERVICES

Water for the process, human consumption and fire fighting will be obtained from Kennecott and stored in a tank on the site. A diesel-powered pump will ensure water pressure for fire fighting. Electrical power will be obtained from Utah Power and Light electrical lines.

Sewage will be disposed of by a septic tank. The effluent will then be injected into the Kennecott copper leach system. Laboratory wastes will also

be placed into the copper leach system. Trash and garbage will be hauled off-site and disposed of at an approved location.

Vehicular access to the plant site will be via existing roads. It is estimated the plant will have a total work force of 13 people spread over 3 shifts, 7 days per week.

PROCESS WASTES AND EFFLUENTS

The plant will receive approximately 6,666 gallons per minute of uranium bearing solution directly from the Kennecott process after the dissolved copper has been removed. The Wyoming Mineral Corporation process will remove the uranium from this solution, then return it by gravity into Kennecott's system for return to the dump.

Minor liquid discharges of the process originate from the ion-exchange, solvent extraction, solvent washing and ammonium diuranate precipitate dewatering operations. Liquid discharges will flow out of the plant in the tails stream and back to the Kennecott copper leach system. These wastes will be released from the plant at an estimated rate of 44 gpm. The waste stream consists of water, sulfate, unrecovered uranium oxide, ammonium and sodium. It has been determined that the only increase of waste concentrations in the tails stream is in the ammonium and sodium concentrations. Due to the large dilution capacity of the tails stream, ammonium is estimated to increase by 3×10^{-3} ppm, sodium descrease by 1 ppm, sulfate decrease by 524 ppm and uranium oxide decrease by 5.4 ppm. All releases into the tails stream flow back into the copper leach circuit where they are further diluted and pumped up to the copper leach dumps.

In addition, trace amounts of the following elements will be removed from the feed stream along with the product: Al, Ag, B, Bi, Ca, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Sb, Si, Sn, Ti, V, Zn, and Zr.

Gaseous releases to the atmosphere will be approximately 30 liters per minute of carbon dioxide originating from decomposition of sodium carbonate.

Vaporization of organics from the solvent extraction system will be minimal due to the low vapor pressure. Ammonia produced during drying and calcining will be captured in wet scrubbing systems. Additional releases may include stack gases from the burning of No. 2 fuel oil at the average rate of 2 million BTU per hour. All tanks and vessels used in the process will be covered.

The radiation doses received by individuals outside the plant will be indistinguishable from the natural background radiation. The only release of uranium and its daughter products from the plant to the environment will be losses through the dryer exhaust stack. The dryer will use a wet scrubber and if needed, filters to ensure that all radionuclide concentrations in the air at all site boundaries will be less than the maximum permissible concentrations levels as defined by federal regulations.

ENVIRONMENTAL EFFECTS

Construction Effects

During the one-year construction phase, the effects upon the environment will be small and temporary in nature. The small number of personnel to be involved in construction are expected to come predominantly from local communities. Hence, there will be no requirement for new housing and community services.

Dust created by vehicular traffic and construction machinery will be minimal because the activity will be low. The only unpaved roadways to be used will be those on Kennecott property. Surface erosion will be small because of the low rate of annual rainfall, the low gradient of the surface of the site and the use of existing roadways. Noise from the construction activities is expected to be within acceptable limits.

On the site, the chief chemicals to be used during construction will be soaps, detergents, paints, cleaning fluids, concrete mixtures, asphalt, lubricants, and petroleum fuels. All trash and oily wastes will be gathered and hauled off-site to proper disposal sites. Sanitary wastes are expected to be handled by portable chemical toilets.

Operation Effects

During plant operation, the principal chemical discharges will be the process wastes and effluents discussed previously (Process Wastes and Effluents). Biologic surveys have concluded there will be a negligible effect on the vegetation and wildlife of the area due to the small size of the plant. Additional studies have indicated that there will be no impact on any historic or archaeological sites.

Socio-Economic Effects

Plant construction will require approximately 100 temporary personnel for about nine months with an estimated payroll of about $700,000. Most of the personnel will be drawn from the labor pool in the Salt Lake County area. The plant is expected to have a useful economic life of at least 20 years. During this time there will be a minimum of 13 operating employees with an estimated payroll of $120,000 per year (1976 dollars). While the level of employment anticipated will not reduce unemployment significantly, the plant operating jobs will offer long-term stability.

The establishment of the plant will enlarge the local tax base while creating little new demand on local government services. Salt Lake County and the State will benefit by the real estate, business inventory and sales taxes generated by the activity of the plant. They will also derive tax benefits from the employee payroll, most of which will be expended locally.

The magnitude of the proposed operations is so small that it will have no perceptible impact on the existing social structure.

ATTACHMENT B

AIR EMISSIONS DATA

Dryer Calciner

The Uranium Recovery Plant will have an electric multi-turbo dryer that will dry and calcin the ammonium diuranate slurry from the centrifuge. The exhaust gases from the dryer will be scrubbed by a venturi dilute acid scrubber before they are exhausted out the stack. The liquid bleed from the scrubber will be injected into the plant circuit to recover any uranium values it may contain.

The dryer will use electricity to heat the slurry and may be operated 8 hrs/day, 7 days/week. It is estimated that the dryer will produce 125,000 lbs/yr of U_3O_8, but may produce a maximum of 143,000 lbs/year. In this report all emissions have been calculated based on the worst case of a 4 hr. day, a 5 day week, a 260 day year, and a yearly production rate of 143,000 lbs/year (770 lbs/day).

Stack emissions are anticipated to contain water, nitrogen, ammonium, and uranium. Emission amounts from the dryer are estimated to be; 2.1 lb/hr - nitrogen, 9 lbs/hr. ammonium, and less than 4 lbs/hr. - uranium oxide. This estimate is based on the following worst case formula (in actual operation the uranium will not be completely calcined and ammonium emissions will be less):

Ammonium diuranate	Ammonium + Water + Nitrogen + Uranium Oxide
$9\ (NH_4)_2\ U_2O_7$	$14NH_3 + 15H_2O + 2N_2 + 6U_3O_8$

Emission amounts from the scrubber are estimated to be: 2.1 lbs/hr - nitrogen and 2.5 gm/hr - uranium oxide.

The emission rate from the dryer is estimated to be 500 ACFM. It is estimated that emissions will have a temperature of 450°F from the dryer and less than 125°F from the scrubber.

The dryer stack will handle emissions from the dryer scrubber and the precipitation circuit scrubber at an emissions rate of 800 ACFM. Ammonia emissions out the stack are estimated to be less than 10 grams per hour. The stack will be designed according to the Uniform Building Code for a low temperature exhaust (at least three feet above the highest point where they pass through the roof of the building and at least two feet higher than any portion of a building within 10 feet). It is estimated the stack will be 40 feet high.

Boiler

It is anticipated the plant will have a forced air draft boiler to provide comfort heat. The boiler will use fuel oil (No. 2 distillate) and it is estimated that its maximum fuel oil consumption will be 1.68 million BTU/hr. (12 gal/hr.). The boiler will have its own stack which will be designed according to the Uniform Building Code for a low temperature exhaust.

Precipitation Circuit

The precipitation circuit will be hooded and vented through a venturi liquid scrubber. Bleed fluid from the scrubber will be injected into the plant circuit. Emissions from the precipitation circuit are anticipated to contain carbon dioxide and ammonia. The emissions rate to the scrubber is estimated to be 300 ACFM. Emissions from the scrubber will be fed into the same stack as the emissions from the dryer scrubber.

ATTACHMENT C

Monitoring

Annual samples will be collected at the following locations:

a. Immediate environment of that facility, located in an unrestricted area, which is nearest to a site boundary.

b. Copperton City Park

c. Downwind from dryer/calciner exhaust stack at a distance of approximately 10 stack heights.

Collection and analysis parameters will be such that the minimum detectable activity of sampling and analysis procedures shall be consistent with those recommendations as presented in the final form of NRC Draft Guide 4MM, Measuring, Evaluating and Reporting Radioactivity in Releases of Radioactive Materials in Liquid and Airborne Effluents from Uranium Mills.